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PETROLOGICAL ABSTRACTS AND REVIEWS

EDITED BY ALBERT JOHANNSEN

McLINTOCK, W. F. P. *Guide to the Collection of Gemstones in the Museum of Practical Geology.* London, 1912. Pp. 92.

This pamphlet is much more than a guidebook, the first thirty-four pages being devoted to a general discussion of the properties of gemstones, the manner of cutting, etc. The remaining pages are devoted to descriptions of the different gems found in the collection, information being given in regard to crystal form, occurrence, methods of cutting, coloring, etc. American museums might well follow the plan of those of Scotland and England in issuing these useful guides. A. J.

MEAD, W. J. "Some Geological Short-Cuts," *Econ. Geol.*, VII (1912), 136–44.

The author gives some ingenious methods for shortening the labor of various computations. The first of these is a graphical method for the determination of the composition of a rock from its mineral constituents. It consists in reading directly from diagrams the component oxides of the minerals. Unfortunately for the majority of petrographers, the author reproduces only one table from a set of fifty-four of rock-forming and thirty-seven of ore minerals, prepared in blue print form for his students at the University of Wisconsin. For the same purpose, but in much more convenient form, is the author's "geologist's slide rule." This consists of a circular diagram, based on logarithmic principles. The percentages are read by means of an inner rotating disk and a celluloid arm. In the present slide rule, thirty-six common rock-forming minerals are included, and the author has in preparation a similar one for thirty-eight of the principal ore minerals. A third short-cut is the "straight-line method" by which direct comparison may be made, without recalculation, of analyses of fresh and altered rocks to show the change in composition due to alteration. A. J.

MENNELL, F. P. *A Manual of Petrology.* Chapman & Hall, London, 1913. Pp. 256, figs. 124. 7*s.* 6*d.* net.

This work, originally planned as the third edition of Mennell's *Introduction to Petrology,* was so much changed during revision, that a new title was used. The book is designed for the working geologist while "the more elementary portions are chiefly intended for the student"! As has been the case with many recently issued petrological textbooks, the first portion is given up to the rock-forming minerals, 80 pages being here so employed. Chapters are devoted to the classification, structure, origin, metamorphism, and weathering of rocks, and various rock types are discussed. The author bases his classification of the igneous rocks upon their chemical composition, and divides them, in a very simple manner, by their silica content,.thus:

	Plutonic	Intrusive	Effusive
Acid, over 65 per cent silica.............	Granite	Granophyre	Rhyolite
Sub-acid, 60 to 65 per cent.............	Syenite	Orthophyre	Trachyte
Sub-basic, 55 to 60 per cent.............	Diorite	Porphyrite	Andesite
Basic, 45 to 55 per cent................	Gabbro	Dolerite	Basalt
Ultrabasic, less than 45 per cent.........	....	Picrite	Limburgite

This classification is simple enough, but it does not show genetic relationships. It would be impossible, by the use of the microscope, to classify rocks according to this system. Chemical analyses would have to be made of every rock, a prerequisite entirely out of the question in practical work. Furthermore, the names thus limited by the silica content have already been used for rocks of certain mineralogical composition, and the new definitions for the old terms cause further confusion in an already almost hopelessly confused nomenclature.

ALBERT JOHANNSEN

MERRILL, GEORGE P. "On the Supposed Origin of the Moldavites and Like Sporadic Glasses from Various Sources," *Proc. U.S. National Museum*, XL (1911), 481–86.

The greenish, chrysolite-like glass pebbles found in many regions and called moldavite, billitonite, australite, obsidianite, or obsidian bombs, are all included by Suess under the name tektites, and are regarded by him as being of ultra-terrestrial origin, the markings being a consequence of their mode of origin. To this Merrill takes exception, regarding the Bohemian and Moravian specimens as water-worn pebbles of weathered glass, originally etched by corroding vapors or solutions, and the Australian forms as pebbles, water-worn or abraded by wind-blown sands. He does not wish to controvert the theory of an original cosmic origin, but thinks until they have been seen to fall, that their source is to be found only in the conditions under which they occur.

A. J.

MERWIN, H. E. "A Method of Determining the Density of Minerals by Means of Rohrbach's Solution Having a Standard Refractive Index," *Amer. Jour. Sci.*, XXXII (1911), 425–28.

After making specific-gravity determinations by means of Rohrbach's heavy solution, the writer determines the density of the latter by means of its refractive index. A comparative table of values of density at 20° C. and corresponding refractive indices is given.

A. J.

MERWIN, H. E. "Quartz and Fluorite as Standards of Density and Refractive Index," *Amer. Jour. Sci.*, XXXII (1911), 429–32.

Quartz and fluorite from different parts of the world were compared and it was found that at ordinary room temperature the density of pure quartz is 2.6495± .0010 and of pure fluorite 3.180± .001. By sodium light the refractive index (ϵ) of quartz was found to be 1.5443−1.5442, and of fluorite, 1.4338+ and 1.4338−.

A. J.

MERWIN, H. E. "Media of High Refraction for Refractive Index Determinations with the Microscope; Also a Set of Permanent Standard Media of Lower Refraction," *Jour. Wash. Acad. Sci.*, III (1913), 35–40.

To fill the gap between fluids having refractive indices from 1.33 to 1.80 and from 2.1 to 2.4, Merwin proposes solutions of iodoform, tri-iodide of arsenic, tri-iodide of antimony, tetra-iodide of tin, and sulphur in methylene iodide. With various proportions dissolved in 100 parts of methylene iodide, fluids of refractive indices between 1.764 and 1.868 are obtained. Fluids from 1.74 to 2.28 were obtained by dissolving arsenic trisulphide in methylene iodide near its boiling-point. Merwin also prepared resin-like substances with indices between 1.68 and 2.10 by dissolving tri-iodides of arsenic and antimony in piperine. For media between 2.1 and 2.6, he used mixtures of amorphous sulphur and arsenic trisulphide. Other media were mixtures of piperine and rosin for indices between 1.546 and 1.682, and mixtures of rosin and camphor for 1.510 to 1.546.

A. J.

MERWIN and LARSEN. "Mixtures of Amorphous Sulphur and Selenium as Immersion Media for the Determination of High Refractive Indices with the Microscope," *Amer. Jour. Sci.*, XXXIV (1912), 42–47.

For minerals having very high refractive indices, Merwin and Larsen propose using molten sulphur, molten selenium, and mixtures of the two, these substances being miscible in all proportions when in a molten condition. The mixtures are prepared by placing the required weight of powdered selenium in a three-inch test tube, heating it until the mineral is thoroughly fused, and allowing it to cool. The proper amount of pure flowers of sulphur is now added and the mixture heated just enough to allow thorough mixing with a glass rod. As the material cools it is gathered on the rod and is cut into small fragments. These may now be returned to the tube, which should be corked, and preserved for use.

To determine refractive indices with this preparation, a small piece of it and a little of the mineral, finely pulverized, are heated together on an object-glass and under a cover-glass, over a small flame, until the preparation is liquid, when the two are mixed and pressed into a thin film. The film is again heated for half a minute until bubbles begin to appear, when it is again pressed thin and cooled, after which the determination is made in the usual manner.

A. J.

MILCH, L. "Grundzüge der Kristallographie," *Taschenbuch f. Math. u. Phys.*, Leipzig u. Berlin, 1913, 359–81.

MILCH, L., and RENZ, CARL, "Ueber griechische Quarzkeratophyre," *Neues Jahrb.*, XXXI (1911), 496–534.

In Argolis and on Hydra, quartz keratophyres and keratophyre tuffs appear, probably of Devonian age. Seven analyses are given.

A. J.

MILCH, L. "Ueber die Beziehungen des Riesengebirgsgranits, (Granitit) zu dem ihn im Süden begleitenden Granitzuge," *Centralbl. f. Min., etc.*, 1911, 197–205.

In an earlier paper Milch had asserted that the two granite areas in question form a single intrusion, the two-mica granite being simply an altered phase of the granitite. Rimann maintained that the two areas represented distinct intrusions. The present paper is a reply to Rimann, and reasons are given for the contention that the mass is a unit.

A. J.

MILCH, L. "Die Systematik der Eruptivgesteine. Erster Teil," *Fortschr. d. Min. Kristallog. u. Petrog.*, III (1913), 189–227.

A history of the development of mineralogical classifications of rocks. Chemical classifications are to be treated in the volume for 1914.

A. J.

MILLER, BENJAMIN L. "The Geology of the Graphite Deposits of Pennsylvania," *Econ. Geol.*, VII (1912), 762–77.

MILLER, WILLIAM J. "The Garnet Deposits of Warren County, New York," *Econ. Geol.*, VII (1912), 493–501.

The author believes the garnets to be due to the assimilation of the Grenville sediments by the intruded igneous rocks.

A. J.

MILLER, WILLIAM I. "Contact Action of Gabbro on Granite in Warren County, New York," *Science*, XXXVI (1912), 490–92.

The author distinguishes nine zones, passing from the typical gabbro to the typical granite country rock. He gives the mineralogical composition of each zone.

A. J.

MOORE, ELWOOD S. "Hydrothermal Alteration of Granite and the Source of Vein-Quartz at the St. Anthony Mine," *Econ. Geol.*, VII (1912), 751–61.

PAIGE, SIDNEY. "The Geologic and Structural Relations at Santa Rita (Chino), New Mexico," *Econ. Geol.*, VII (1912), 547–59.

PAIGE, SIDNEY. "The Origin of Turquoise in the Burro Mountains, New Mexico," *Econ. Geol.* VII (1912), 382–92.

The author gives arguments both for the deep-seated origin of turquoise and for its origin in the zone of weathering. He apparently inclines to the latter belief.

A. J.

RAMSAY, WILHELM. "Beiträge zur Geologie der Halbinsel Kanin," *Fennia*, XXXI (1911), No. 4, pp. 45.

A geologic history of the Kanin Peninsula. An analysis of diabase is given.

A. J.